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Increasing Participation of Diabetic Patients in Diabetes Self-Management by Identifying Barriers Hindering the Achievement of Diabetes Self-Management Behaviors in a Medical-Surgical Unit

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Increasing Participation of Diabetic Patients in Diabetes Self-Management by Identifying Barriers Hindering the Achievement of Diabetes Self-Management Behaviors in a Medical-Surgical Unit

Diabetes is not only a chronic disease but also a public health issue in the United States. In 2012, diabetes affected approximately "29.1 million Americans, or 9.3% of the entire population, including 21 million diagnosed cases and 8.1 million undiagnosed cases. Type two diabetes represented about 90% to 95% of all diagnosed cases of diabetes in the United States" (Centers for Disease Control and Prevention, 2014, p. 8). During the same period, the estimated cost of diabetes was "$245 billion, with $176 billion accounting for direct medical cost, and $69 billion related to decreased productivity" (American Diabetes Association, 2013, p.1033).

Self-management education has been proven to be the pillar of successful diabetes management (Mphil, Sit, Leung, and Li, 2016). Managing this chronic disease can be challenging; it involves diabetic patients themselves and mostly the changes in their daily routines. These daily routines include making adjustments to assume the responsibility of a complicated daily regimen of proper eating habits, monitoring blood glucose level, adherence to medication treatment, regular physical activity, smoking cessation, and dealing with psychological and emotional aspects of living with a chronic disease.

Clinical Leadership Theme

This project intends to increase participation of diabetic patients in diabetes self-management by identifying and addressing barriers and obstacles hindering the achievement or maintenance of diabetes self-management behaviors in a medical-surgical unit. The up-to- date evidence-based standards about diabetes self-management will be implemented to overcome the

barriers identified. I will be initiating a culture of evidence-based practice integrating patient preferences, goals and life experiences, and values. The created evidence-based working environment will allow healthcare professionals to translate the clinical standards of self-management education as defined by the American Diabetes Association (ADA), into everyday practice. This strategy intends to close the gap between the best practice and the standard practice in the microsystem where I currently practice.

The clinical leadership competency associated with the theme as mentioned earlier is when the CNL is required to "use evidence in developing and implementing teaching and coaching strategies to promote and preserve health and healthy lifestyles in patient populations" (American Association of Colleges of Nursing, 2013, p19).

An interdisciplinary team led by a CNL, including nursing staff, nurse manager, dietician, case manager, social worker, physical therapist, and nurse educator will be implementing the project. This lateral integration will be the guarantee of success of the project. The clinical leadership competency supporting this aspect is when the CNL is required to "create an understanding and appreciation among healthcare team members of similarities and differences in role characteristics and contributions of nursing and other team members" (American Association of Colleges of Nursing, 2013, p17).

Statement of the Problem

Powers et al. (2015) in their article referred to diabetes as "a complex and burdensome disease that requires the person with diabetes to make numerous daily decisions regarding food, physical activity, and medications. It also necessitates a proficiency in some self-management skills" (p.1372). The American Diabetes Association (ADA) has issued a position statement recommending health care professionals to provide self-management education to all diabetic

patients when newly diagnosed and on an ongoing basis after that. The ADA (2013) defined diabetes self-management education as "an interactive, collaborative process that can equip adults with the basic knowledge to manage their diabetes, while focusing on their problems and goals" (p.1034). Furthermore, diabetes self-management education "emphasizes problem-solving and decision making as they relate to core diabetes self-care skills such as healthy eating, physical activity, proper dental care, and monitoring blood glucose" (ADA, 2014, p. s15). In a nutshell, "diabetes self-management education is guided by evidence-based standards, incorporating patients' needs, goals and life experiences" (ADA, 2014, p. s16).

The microsystem where I currently practice is a medical-surgical unit with a capacity of 35 beds. Most patients admitted with diabetes as either primary or secondary diagnosis are African Americans, Hispanics, and Asian Americans men and women who are more prevalent to type two diabetes mellitus. From admission to discharge, most of those patients only receive traditional diabetes education which is often insufficient to change their health behaviors.

In my microsystem of practice, there has been a failure to translate the clinical standards of self-management education as defined by the ADA, into everyday practice. Despite the numerous benefits associated with the diabetes self-management education including among others, the improvement of patient care outcomes, the decrease of hospital costs and length of stay, there is still a significant gap between the suggested guidelines and the common practice. The number of diabetic patients receiving diabetes self-management education before discharge is still relatively small, less than 5% of diabetic patients receive an appropriate education in diabetes self-management.

Project Overview

This project aims at increasing the diabetes self-management education participation by at least 20% by the end of August 2017. Engaging diabetic patients in identifying and addressing barriers and obstacles hindering the achievement or maintenance of diabetes self-management behaviors will allow the attainment of this goal. This project will not only provide evidence-based knowledge on diabetes to patients and nurses but will also be focusing on patients' behaviors, enabling them to take up self-management of their illness. From the healthcare providers' perspectives, the achievement of the goal as mentioned above will be by identifying and developing strategies to overcome barriers related to the implementation of evidence-based practice and by creating a culture integrating patient preferences, goals and life experiences, and values.

Rationale

The facts mentioned above highlight to some extent the failure of health care providers to translate clinical standards into clinical practice, contributing to the gap observed. As a result of this observation, it became imperative to implement a quality improvement project gearing toward increasing the participation of diabetic patients in diabetes self-management. Identifying and addressing barriers and obstacles hindering the achievement or maintenance of diabetes self-management behaviors will facilitate the closing of the performance gap as mentioned earlier.

By receiving diabetes self-management education, patients could avoid unnecessary and preventable costs such as the cost of readmission including the average length of stay estimated at $5000 per patient per night in my microsystem. By not staying longer in the hospital because of diabetes, patients would avoid physical and emotional pain, additional medical interventions, and potentially harmful side effects from pharmacological interventions. According to the ADA

(2013), estimated medical costs among diabetic patients were about $ 13741 compared to $ 5853 for nondiabetic patients. Diabetes self-management education could help to decrease that burden significantly.

Identifying and addressing the barriers and challenges related to diabetes self-management education will be mostly done by an interdisciplinary team led by the future CNL during the internship hours allocated for the project, and will not incur any additional costs to the microsystem. Patients' education will be done through the one-on-one instruction and role playing, using the printed materials on diabetes and equipment already available in the microsystem at no additional costs. Otherwise, a full-time CNL paid at $60 per hour for a total of 220 hours allocated for the project will cost $13200; this represents a saving for the microsystem. The interdisciplinary team including nursing staff, nurse manager, dietician, case manager, social worker, physical therapist, and nurse educator will be involved in the implementation of the project during their regular and scheduled encounters with diabetic patients. The salary paid to each member of the interdisciplinary team constitutes a saving for the microsystem as well. A strong commitment and support from the multidisciplinary team will contribute to the sustainability of this project.

The sensitization of nurses will consist to raise their awareness on the benefits of evidence-based practice during a scheduled in-service at no additional costs for the microsystem. I will be posting a summary of research studies on diabetes self-management education to nurses, and I will also be giving some update on the latest evidence in short staff gatherings such as the beginning of the shift huddles at no additional costs for the microsystem. Facilitating nurses' access to peer-reviewed research articles on diabetes self-management education will be done through one-on-one contact using databases already accessible on the computers available in the microsystem. The little overhead associated with the diabetes self-management education increases its feasibility.

A process map (flow chart) identified the gap in diabetes self-management education in a medical-surgical unit for patients admitted with a diagnosis or family history of diabetes (See Appendix A). This process map shows that most diabetic patients do not receive formal diabetes self-management education as recommended by the American Diabetes Association before discharge.

A root cause analysis – fishbone diagram (see Appendix B) was performed to identify the causative factors that led to the insufficient participation of diabetic patients in diabetes self-management education as recommended by the guidelines of the American Diabetes Association. The diagram through its main categories including healthcare providers, patients/families, materials, and communication, highlights the specific causes related to the insufficient participation of diabetic patients in diabetes self-management education in a medical-surgical unit. Those causes include among others the practice of traditional approach of diabetic education not guided by evidence-based standards and the lack of knowledge and lack of motivation of patients about diabetes self-management education.

A SWOT analysis (see Appendix C) highlighted the strengths and weaknesses of the quality improvement project about the context of external opportunities and threats. I will be addressing some weaknesses and threats identified in the SWOT analysis during the implementation of the project. The empowering attitude of healthcare providers and tailored approach focusing on patients' expectations and needs were the main strengths identified. I will be addressing one of the major threat related the misperceptions or negative views of nurses about the evidence-based practice by raising their awareness on the benefits of evidence-based practice in the improvement of patient care outcomes.

A stakeholder analysis identified the interdisciplinary team led by the future CNL, physicians, diabetic patients and their families as key stakeholders. See Appendix D for the description of their interests and role as partners.

Methodology

The overall objectives of this quality improvement project are to promote diabetes preventive care behaviors while decreasing long-term complications. Emphasis will be put on "problem-solving skills and decision making as they relate to core diabetes self-care skills such as healthy eating, blood glucose monitoring, physical activity, encourage active collaboration with the health care team, and improve clinical outcomes" (Powers et al., 2015, p. 1375).

I intend to collect primary data and do pre- and post-test questionnaires based on the trademark list of seven diabetes self-management behaviors developed by the American Association of Diabetes Educators (AADE) to guide people with diabetes toward positives outcomes and a healthy lifestyle. Those practices include "healthy eating, being active, blood glucose monitoring, taking medication, problem-solving, healthy coping, and reducing risks" (Powers et al. 2015, p. 1375). I will be comparing the pre-and post-test data to determine if my educational intervention improved patients' ability to adhere to diabetes self-care behaviors. Overall the design of this project will be a quasi-experiment without randomization including a pre-test, intervention, and post-test. See Appendices E and F for pre- and post-test questionnaires.

The patient-centered care model adapted from the work of Whittemore (2006), will be used as a theoretical framework for this project. The patient-centered model not only incorporates the theories of behavioral changes but also encompasses five levels of assessment and intervention to address diabetes self-management education including "cognitive, attitudinal, instrumental, behavioral, and social levels" (Brunk, Taylor, Clark, Williams, & Cox, 2017, p.188). The cognitive

level will be focusing on the knowledge and awareness of diabetes and the benefits of diabetes self-management. The attitudinal level will be addressing the "beliefs, intentions, and readiness to change" (p.188), in relation with the diabetes self-management. The instrumental level includes the "skills necessary to support behavior change, such as performing blood glucose monitoring or measuring portions" (p.188). The behavioral level involves "goal setting, coping, and problem-solving skills needed to support and maintain change" (p.188), concerning diabetes self-management. The social level encompasses the "social support and the use of resources" (p.188).

Literature Review

The literature review presented in this section was done using a PICO strategy. Articles published in the last five years from 2012 to 2017 were searched, using the electronic databases, CINAHL, MEDLINE, and PsycINFO. I used the PICO search strategy including "diabetes," "self-management," "barriers" and "intervention." I selected six relevant articles for review.

Mphil, Sit, Leung, and Li (2016) performed a cross-sectional study involving 346 participants diagnosed with type 2 diabetes, to investigate the correlation between self-efficacy and self-management barriers in diabetic patients. The participants were interviewed using the "personal diabetes questionnaire" developed by Stetson et.al. (2011). The study revealed that the lack of diet knowledge was one the biggest challenges; and that the high level of self-management barriers leads to the low level of self-efficacy. Other specific barriers included lack of social support, maladaptive coping mechanisms, low perceived susceptibility to complications. The authors concluded that "interventions which enhance individuals' positive appraisal of diabetes have the potential to alleviate the adverse effects of self-management barriers" (Mphil, Sit, Leung, and Li, 2016, p.360).

Joo and Lee (2016) conducted a qualitative descriptive study using a purposive sampling involving 18 participants and three focus group to identify potential barriers of diabetes self-management among Korean-Americans diagnosed with diabetes type 2 in the United States. The study revealed five barriers including "the high cost of type two diabetes care, language issues, loss of self-control, memory loss, and limited access to healthcare resources" (p.277). The authors recommended the implementation of national guidelines for providing culturally competent health services to alleviate the language barrier which appears to be the main frustrating factor. They also urged healthcare providers to use language services for educational materials and consultations systematically.

DiZazzo et al. (2017), conducted a qualitative study involving five Arab American physicians, three pharmacists serving Arab-American living in the metropolitan area of Detroit, and two focus group, to evaluate the providers' perspectives on barriers to diabetes self-management in Arab Americans. The study revealed that "the main obstacles to diabetes self-management from providers' perspectives were diabetes disease itself and patients' denial or refusal to recognize it, reflecting the stigma of illness, misconceptions, and characteristics of health care providers and the healthcare system" (p.45). The authors suggested a family-centered approach as the most efficient facilitator of diabetes self-management. Additionally, they mentioned that providers need to allocate more time to provide diabetes self-management during clinical encounters

Tiedt and Sloan (2015), performed a phenomenological study, using a purposive sampling involving "ten Coeur d'Alene tribal members, seven females and three males" (p. 287), to examine their experiences with diabetes type two, and identify barriers to diabetes self-management. "Perceived unsatisfactory care emerged as the main obstacles to self-management, including

communication barriers related to distrust, misunderstanding, and educational methods, and organizational barriers related to the quality of care and access issues" (Tiedt & Sloan, 2015, p. 287). The authors suggested providing culturally competent care, building trust and including patients and families in the elaboration of the plan of care, to alleviate those barriers.

Nguyen and Edwards (2014), performed a qualitative ethnographic study involving 23 Vietnamese Americans to analyze barriers to diabetes self-management among Vietnamese Americans. The study revealed many obstacles including: "little diabetes literacy, limited English proficiency, unhealthy eating, lack of time and motivation, side effects of medication" (Nguyen & Edwards, 2014, p.5). The main finding was the lack of knowledge regarding the basic pathophysiology and acute complications of diabetes. For example, "only one out of 23 participants understood the purpose and healthy level of hemoglobin A1c. The authors suggested the knowledge of recent and target Hemoglobin A1c as a precondition for effective diabetes self-management behaviors" (p.6).

Rodriguez (2013), in her study, identified intrinsic and extrinsic factors susceptible to hinder patient engagement in diabetes self-management. The fundamental factors include "attitudes and health beliefs, depression, self-efficacy, diabetes knowledge and technical skill, ethnic perspectives, functional health literacy, and medication adherence" (Rodriguez, 2013, p. 171). The extrinsic factors include "financial capabilities, family influences, workplace environment, community environment, clinical relationship, access to effective health care delivery" (Rodriguez, 2013, p. 171). The author revealed that the focus should not be on the disease itself but rather on the individual with the illness, the patient's life, and health belief, and to build a trusting healthcare provider-patient relationship. The author also recommended the incorporation of depression screening into the patient care, because the presence of depression can seriously

challenge the inability to implement self-care behavior. The author also emphasized the necessity of providing a culturally competent care including lifestyle modifications, medication management for example.

Timeline

The project started at the end of May 2017 with the microsystem analysis and the need assessment. The pre-intervention data collection began in mid-June 2017. The implementation or intervention started at the beginning of July 2017 and will continue until the end of July 2017. The post-intervention data collection and the project evaluation will occur during the month of August 2017 to determine the effectiveness of the intervention. The main limitation during the implementation phase is the current shortened lengths of hospital stays that could hinder the evaluation of the efficacy of the intervention. Sensitizing participants to provide their telephone numbers voluntarily, could help to overcome this potential challenge, allowing me to do the phone interview to assess the behavior change and the improvement of overall health status, as a result of diabetes self-management education. See Appendix G for more review of the timeline.

Expected Results

My expected results are to increase the diabetes self-management education participation by at least 20%, raise awareness of diabetic patients on the importance of diabetic self-management, and to enable them to take up self-management of their illness. I will be comparing the pre-and post-test data to determine if my educational intervention was effective. During the post-test, I will also be assessing the changes in the seven diabetes self-management behaviors developed by the American Association of Diabetes Educators (AADE). I am also expecting to introduce a culture of patient care based on evidence integrating patient preferences, goals and life experiences and values.

Nursing Relevance

Self-management is essential in a chronic and devastating disease like diabetes. This project will help healthcare providers to have a better understanding of the barriers susceptible to hinder the implementation of diabetes self-management education. The diabetes self-management education will not only improve the overall health status of individuals living with diabetes, but it will also provide them a valuable opportunity to acquire skills and knowledge to overcome potential barriers to self-care management. This project will also allow healthcare providers to integrate the principles of patient-centered care into their everyday practice. They will be providing diabetes care based on evidence approach tailored to patients' expectations, needs and values. The confidence and competency acquired during the training will increase their ability to self-manage their disease and will contribute to reducing the burden of morbidity and mortality related to the complications of diabetes.

Pretest

Approximately 30 minutes was required to explain the project and complete the pre-test for each participant. Additional follow up was needed to continue to identify patient preferences and requirements for diabetes self-management education. Assessments included demographic information and the identification of barriers and obstacles hindering the achievement of diabetes self-management behaviors developed by the American Association of Diabetes Educators (AADE) to guide people with diabetes toward positives outcomes and a healthy lifestyle. The barriers were identified according to the seven diabetes self-care activities including "healthy eating, being active, blood glucose monitoring, taking medication, problem-solving, healthy coping, and reducing risks" (Powers et al. 2015, p.1375). Participants described the limited accessibility and the high cost of healthy foods in their neighborhood, the inability to read food

labels, the lack of knowledge about carbohydrate counting, and the lack of social support as the main barriers to maintaining a healthy eating. Some participants mentioned the lack of time and lack of motivation as the main obstacles to exercise adherence. Patients' lack of knowledge of self-care procedures including blood glucose monitoring, medication management was a common finding. Poor problem-solving skills, maladaptive coping mechanisms, lack of knowledge of acute complications and low perceived susceptibility to complications were among the main barriers. Perceived barriers were consistent with findings in the literature. See Appendix H for results pre-test.

Intervention – Diabetes Self-Management Education

The educational intervention followed the completion of the pre-test questionnaire. The interdisciplinary team based the self-care management interventions on best practices guidelines tailored to the specific needs of participants, to address the barriers as mentioned earlier to achieve or maintain diabetes self-management behaviors. The barriers related to healthy eating was dealt with by educating the involved participants on how to read food labels, the basics principles of carbohydrates counting, the relationship between food, activity, and blood glucose in preventing hypoglycemia and hyperglycemia, and by providing clear instructions on how to complete a food record. The barriers concerning the adherence to physical activity were addressed by discussing the importance of physical activity in diabetes prevention and management, and by explaining the relationship between physical activity and blood glucose. The involved participants received instructions on how to complete a health record for activity, the general principles of safe and effective physical activity were reinforced and encouraged. The interdisciplinary team addressed the barriers related to the adequate monitoring of blood glucose by teaching participants on the benefits of monitoring blood glucose, helping them to create and maintain a personal health record

and discuss results at each visit with their primary care provider. The interdisciplinary team demonstrated the correct technique for monitoring blood glucose to participants, and they returned demonstration. Participants received clear instructions on how to use results of hemoglobin A1c and blood glucose pattern to make informed decisions on diabetes self-management. Participants also received instructions on how to complete personal health record for glucose monitoring. The interdisciplinary team addressed the barriers related to the non-adherence to prescribed medications by reviewing and reinforcing to participants, the importance of taking medications as prescribed, and by discussing the safe use and common side effects of prescribed medications. Participants received instructions on how to complete personal health record for drugs. The interdisciplinary team addressed the problem-solving barriers by providing instructions to patients on hypoglycemia and hyperglycemia prevention, and treatment. The interdisciplinary team provided guidelines for sick day management, and the participants received instructions on how to develop a plan for when to contact diabetes health care provider. The interdisciplinary team addressed the healthy coping barriers by encouraging patients to share stressors with healthcare providers to receive help. They were also invited to journal attitudes and emotions in personal health record as needed. The interdisciplinary team addressed the risks reduction barriers by reinforcing the need for basic preventative and risk mitigation measures including foot care, eye exams, dental exams, smoking cessation, flu vaccines, and other immunizations, as measures to prevent complications. Participants received information on risk reductions strategies and diabetes standards of care. The interdisciplinary team discusses modifiable and non-modifiable risks factors for diabetes and associated complications with interested patients.

Post-test

The post-test was administered one month following the diabetes self-management education to have an idea of the behavior changes achieved by participants. For the most part, the pre-test was identical to the post-test except for some additional questions added to assess the variations in the seven diabetes self-management behaviors developed by the American Association of Diabetes Educators (AADE), and the overall impression of the participants regarding the diabetes self-management education provided. See Appendix I for results post-test.

Conclusions

The overall goal of my CNL project was to increase participation of diabetic patients in diabetes self-management education (DSME) by at least 20%, by identifying and addressing barriers and obstacles hindering the achievement or maintenance of diabetes self-management behaviors in a medical-surgical unit. According to Powers et al. (2015), the American Association of Diabetes Educators (AADE) seven self-care behaviors including "healthy eating, being active, blood glucose monitoring, taking medications, problem-solving, healthy coping, and risk reductions" (p.1375) are keys components to effective self-management. These behaviors and their measurement help establish the core measures of behavioral outcomes associated with DSME.

A pre- test questionnaire was administered to identify the barriers susceptible to hinder the achievement of the self-care behaviors mentioned above, the patients' preferences and needs for DSME. Following the pre-test, an intervention consisting of education of patients in diabetes self-management was implemented to address the identified barriers. The goal of the education was to improve the overall health status by empowering diabetes patients to acquire knowledge, learn skills, develop the appropriate behaviors, develop the problem-solving and coping skills to overcome the barriers and obstacles identified.

A total of 20 diabetic patients completed both the pre – and pot-test questionnaires. 40% of participants were Asian Americans, 30% were African Americans, 20% were Hispanics, 10% were Caucasians. These statistics are consistent with the fact that particular racial or ethnic group in the United States have high rates of type 2 diabetes. In fact, the American Diabetes Association (2014) reports that type two diabetes is less prevalent in Caucasians and more common among African Americans, Hispanics, and Asian Americans in the United States.

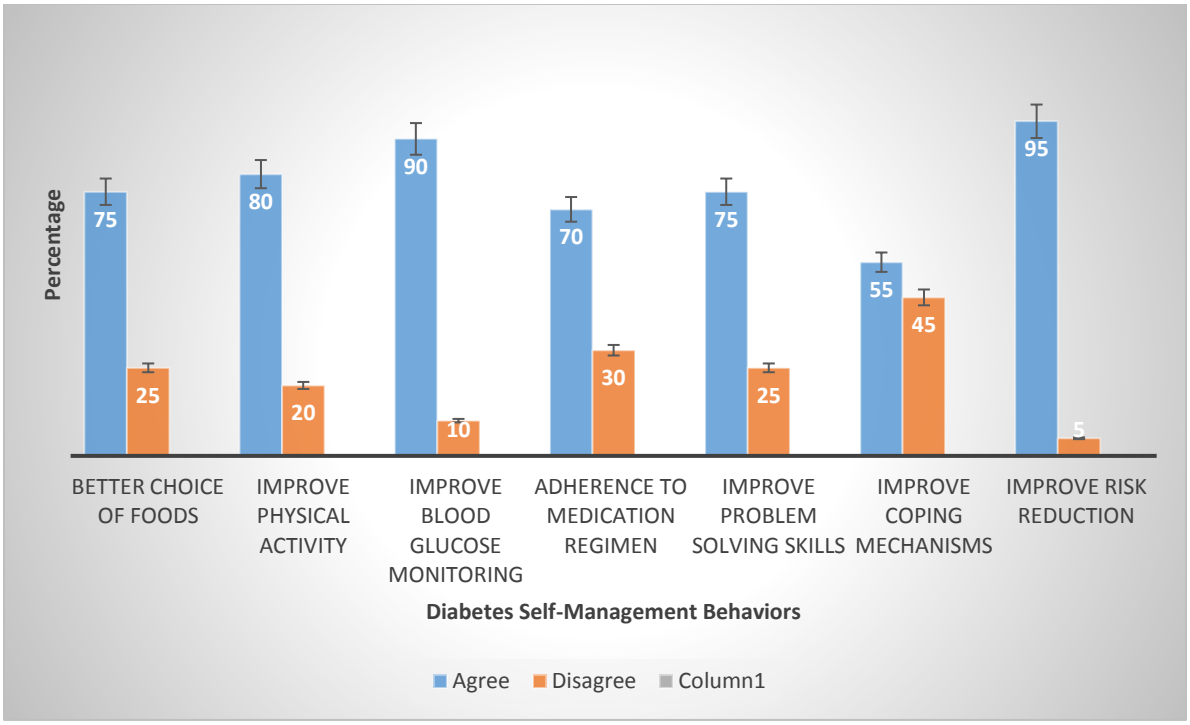
Following the intervention, over 50% of participants agreed to be able to make improvements in diabetes self-management behaviors. Most of them did change their self-management behaviors; others started reflecting on it (see Appendix J, results pre- and-post-test). Figure 1 shows the percentages of participants who made improvement in the following behaviors: making a better choice of foods, increasing participation in physical activity, monitoring blood glucose level, taking medications as prescribed, improving problem solving skills, improving coping mechanisms, understanding of the risks related to diabetes complications and how to prevent them.

The interdisciplinary team including nursing staff, nurse manager, dietician, case manager, social worker, physical therapist, and nurse educator were involved in the implementation of the project during their regular and scheduled encounters with diabetic patients. The little overhead associated with the diabetes self-management education increased the feasibility of the project and could contribute to its sustainability. A strong commitment of the interdisciplinary team and the support of the upper management are keys to the viability of this project. During the implementation of the project, the involved stakeholders not only acknowledged the need for the project, but they also expressed their full support for its execution. I presented the results to the

interested parties and the upper management; this strategy could facilitate the sustainability of the project.

During the data collection phase, I noticed that many nurses were not familiar with the evidence-based practice; they displayed a lack of understanding of evidence-based practice and research and the lack of knowledge and skills related to searching current literature. Some old school nurses did not believe that evidence-based practice will result in more positive outcomes than traditional care; they had some misperceptions and negative views about research and evidence-based care. During the implementation phase of my CNL quality improvement project, I started to introduce a culture of patient care based on evidence. First of all, I began to raise the awareness of nurses on the benefits of evidence-based practice in the improvement of patient care outcomes including among others, the decrease of hospital costs and length of stay, and the increase in patient safety and quality of care. I also started to post a summary of research studies on diabetes self-management education to staff, and I was also giving some update on the latest evidence in short team gatherings such as the beginning of the shift huddles. I have also facilitated nurses access to peer-reviewed research articles on diabetes self-management education through one-on-one contact using databases already accessible on the computers available in the microsystem. Currently, the unit manager is willing to start a journal club, and having research articles available for review by nurses. Nurses are more aware of the evidence-based practice process, and are more willing to keep their practice current and relevant, by implementing the most up-to-date research tested evidence.

Figure 1: Reported improvement after Diabetes Self-Management Education



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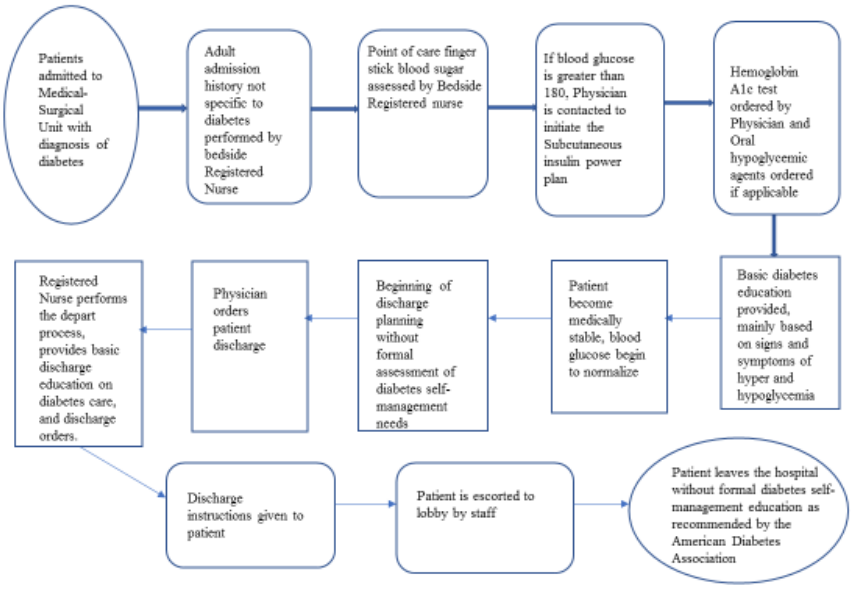
APPENDIX A

PROCESS MAP (FLOW CHART)

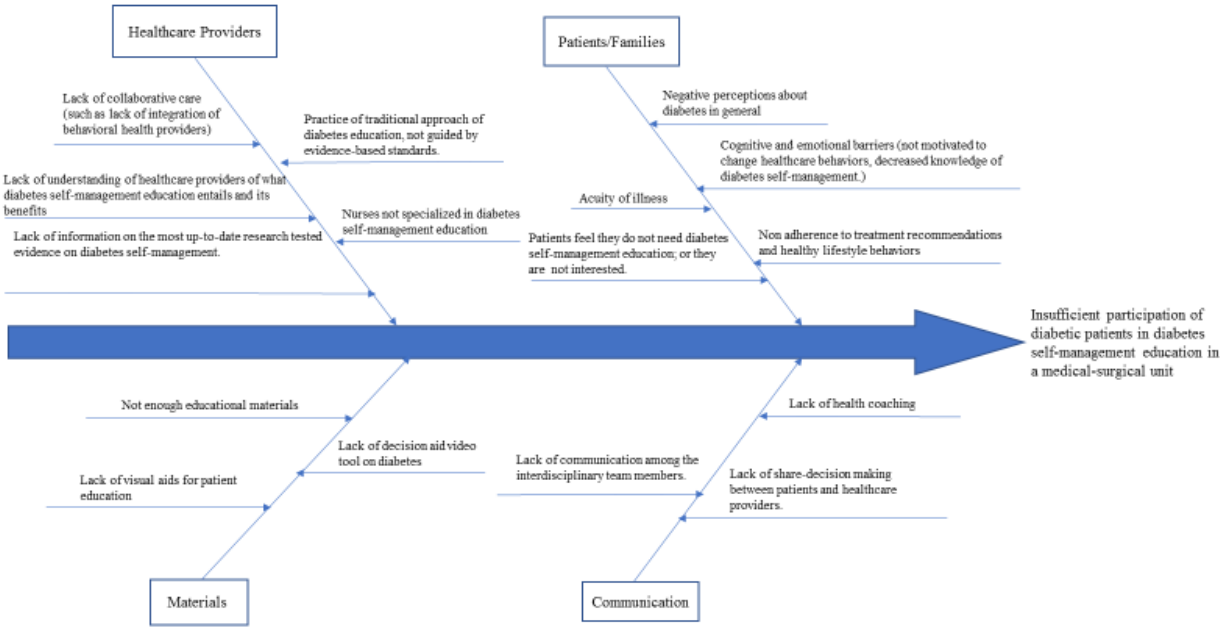
FOR DIABETIC PATIENTS FROM ADMISSION TO DISCHARGE



APPENDIX B

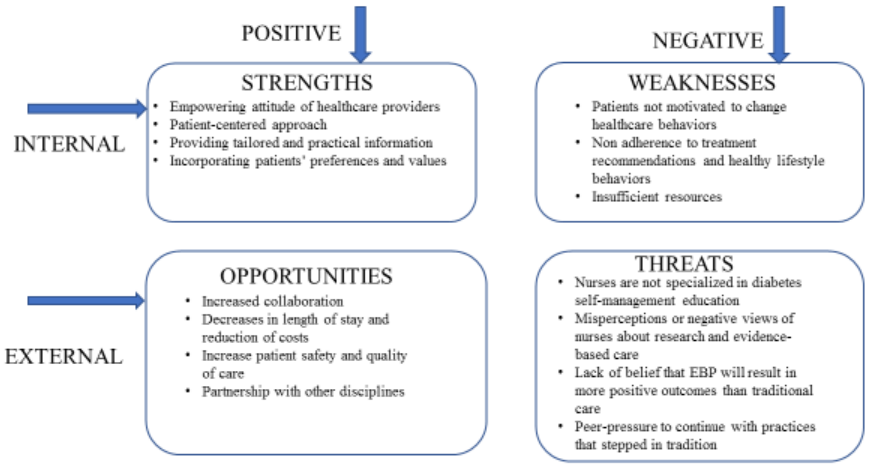
ROOT CAUSE ANALYSIS

FISHBONE DIAGRAM FOR DIABETES SELF-MANAGEMENT EDUCATION



APPENDIX C

SWOT ANALYSIS



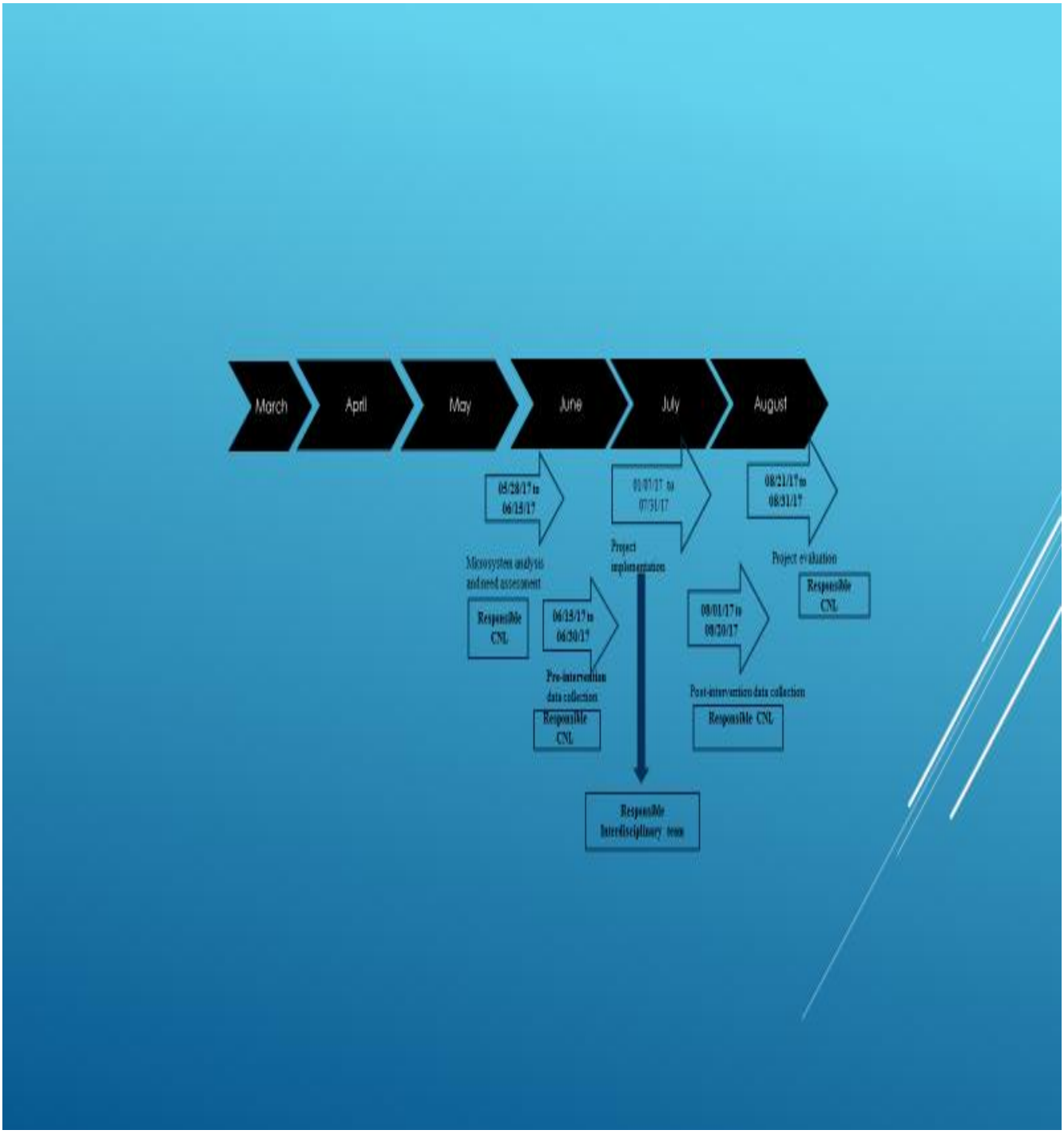
APPENDIX D

STAKEHOLDER ANALYSIS

Stakeholders	**Related interests**	**Role as partner**
Diabetic patients and their families	• Reduce barriers to participation in diabetes self-management • Improve diabetes self-management behaviors • Reduce diabetes related complications and improve quality of life	• Identify diabetes self-management needs, potential barriers, and strategies for success • Collaboratively set goals • Create an action plan
Interdisciplinary team	• Quality diabetes self-management education • Improve patient care outcomes	• Identify barriers to diabetes self-management and best practices to address the identified barriers • Implement diabetes self-management education • Collaboratively set goals • Create an action plan.
Physicians	• Patient implementation of diabetes self-management regimen and achievement of targeted clinical outcomes • Improve patient care outcomes	• Reinforce value of patient participation in diabetes self-management education • Provide information and training to patient and families • Collaboratively set goals • Create an action plan

APPENDIX E

TIMELINE OF ACTIVITIES



APPENDIX F

PRE-TEST QUESTIONNAIRE

A. Demographics

a) Age of participant:
b) Gender: ☐ Male ☐ Female
c) Ethnicity: ☐ White ☐ Black ☐ Hispanic/Latino ☐ Asian ☐ Other
d) Number of years completed in school:
e) Telephone number to use for the post-test (optional):

B. Behavior#1: Healthy eating

1. I don't usually eat healthy food because they are not always available in my neighborhood, and because they cost more to buy.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

2. I usually don't eat right because family or friends tempt me and are not supportive

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

3. I usually don't eat right because I am busy with family, work, or other responsibilities

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

4. I usually don't use food labels as a dietary guide because I don't know how to read the food label, and I have trouble with the calories count

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

C. Behaviors#2: Being active

5. I usually participate in at least 30 minutes of moderate physical activity such as walking, jogging, housework and yard work at least 3 times a week

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

6. I am not usually physically active at least 30 minutes on all or most days of the week because I am very busy with family, work, or other responsibilities

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

D. Behaviors# 3: Blood glucose monitoring

7. I feel comfortable with my blood glucose monitoring skills

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

E. Behavior # 4: Taking medications

8. I know how to take my diabetes medications properly, and I am aware of their actions, potentials adverse effects, correct dosing, and timing.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

9. I usually adhere to the treatment plan and compliant to my medication regimen as prescribed.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

F. Behavior# 5: Problem solving

10. I know how to deal with hyperglycemia and hypoglycemia, and how to modify my regimen when my activity level changes, and what to do if I cannot afford medications or supplies.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

11. I usually set goals and keep records to follow my blood sugar.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

12. I usually keep extra diabetes supplies in major places such in my car, at work to avoid shortages.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

G. Behavior# 6: Healthy coping

13. I sometimes have a feeling of self-blame when others believe that I am diabetic because of my unhealthy lifestyles choices such as overeating and lack of exercise

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

14. I am usually engaged in support group, and have knowledge of available resources

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

15. I feel overwhelmed by the diabetes-related expenses including regular visits to primary care providers and diabetes medications, because I am retired and live on fixed incomes.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

16. I sometimes feel frustrated when I cannot express my needs or concerns related to diabetes to my healthcare provider because of my limited English proficiency.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

17. I am sometimes very depressed and this impairs my ability to implement diabetes self-care behaviors including healthy eating, physical activity, blood glucose monitoring and medication administration.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

H. Behaviors# 7: Reducing risks

18. I don't smoke, I usually see my primary care provider regularly, I get my yearly flu vaccine, I see my eye doctor and my dentist a least once a year, and I usually listen to my body.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

19. I don't have enough knowledge about acute complications of diabetes. And how to avoid them.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

APPENDIX G

POST-TEST QUESTIONNAIRE

A. Demographics

b) Age of participant:

f) Gender: ☐ Male ☐ Female

g) Ethnicity: ☐ White ☐ Black ☐ Hispanic/Latino ☐ Asian ☐ Other

h) Number of years completed in school:

B. Behavior#1: Healthy eating

1. I don't usually eat healthy food because they are not always available in my neighborhood, and because they cost more to buy.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

2. I usually don't eat right because family or friends tempt me and are not supportive

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

3. I usually don't eat right because I am busy with family, work, or other responsibilities

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

4. I usually don't use food labels as a dietary guide because I don't know how to read the food label, and I have trouble with the calories count

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

C. Behaviors#2: Being active

5. I usually participate in at least 30 minutes of moderate physical activity such as walking, jogging, housework and yard work at least 3 times a week

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

6. I am not usually physically active at least 30 minutes on all or most days of the week because I am very busy with family, work, or other responsibilities

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

D. Behaviors# 3: Blood glucose monitoring

7. I feel comfortable with my blood glucose monitoring skills

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

E. Behavior # 4: Taking medications

8. I know how to take my diabetes medications properly, and I am aware of their actions, potentials adverse effects, correct dosing, and timing.

☐"Strongly disagree" ☐ "Disagree" ☐"Agree" ☐"Strongly agree"

9. I usually adhere to the treatment plan and compliant to my medication regimen as prescribed.

☐"Strongly disagree" ☐ "Disagree" ☐"Agree" ☐ "Strongly agree"

F. Behavior# 5: Problem solving

10. I know how to deal with hyperglycemia and hypoglycemia, and how to modify my regimen when my activity level changes, and what to do if I cannot afford medications or supplies.

☐"Strongly disagree" ☐ "Disagree" ☐"Agree" ☐"Strongly agree "

11. I usually set goals and keep records to follow my blood sugar.

☐"Strongly disagree" ☐ "Disagree" ☐"Agree" ☐ "Strongly agree"

12. I usually keep extra diabetes supplies in major places such in my car, at work to avoid shortages.

☐ "Strongly disagree" ☐ "Disagree" ☐"Agree" ☐ "Strongly agree"

G. Behavior# 6: Healthy coping

13. I sometimes have a feeling of self-blame when others believe that I am diabetic because of my unhealthy lifestyles choices such as overeating and lack of exercise

☐"Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

14. I am usually engaged in support group, and have knowledge of available resources

☐"Strongly disagree" ☐ "Disagree" ☐"Agree" ☐ "Strongly agree"

15. I feel overwhelmed by the diabetes-related expenses including regular visits to primary care providers and diabetes medications, because I am retired and live on fixed incomes.

☐ "Strongly disagree" ☐ "Disagree" ☐"Agree" ☐ "Strongly agree"

16. I sometimes feel frustrated when I cannot express my needs or concerns related to diabetes to my healthcare provider because of my limited English proficiency.

☐ "Strongly disagree" ☐ "Disagree" ☐"Agree" ☐ "Strongly agree"

17. I am sometimes very depressed and this impairs my ability to implement diabetes self-care behaviors including healthy eating, physical activity, blood glucose monitoring and medication administration.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

H. Behaviors# 7: Reducing risks

18. I don't smoke, I usually see my primary care provider regularly, I get my yearly flu vaccine, I see my eye doctor and my dentist a least once a year, and I usually listen to my body.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

19. I don't have enough knowledge about acute complications of diabetes. And how to avoid them.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

20. The diabetes self-management education helped me improve my ability to make a better choice of foods.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

21. The diabetes self-management education helped me improve my ability to participate in physical activity.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

22. The diabetes self-management education helped me improve my ability to monitor my blood glucose level.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

23. The diabetes self-management education helped me improve my ability to adhere to medication regimen as recommended.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

24. The diabetes self-management education helped me improve my problem-solving skills.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

25. The diabetes self-management education helped me improve my coping mechanisms.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

26. The diabetes self-management education helped me improve my understanding of the risks related to diabetes complications and how to prevent them.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

27. Overall, I was satisfied with the diabetes self-management education provided by the interdisciplinary team.

☐ "Strongly disagree" ☐ "Disagree" ☐ "Agree" ☐ "Strongly agree"

APPENDIX H

Results – Pre-test

Diabetes Self-Management Behaviors	**Pre-test**			
	"Strongly disagree" (%)	"Disagree" (%)	"Agree" (%)	"Strongly agree" (%)
I don't usually eat healthy food because they are not always available in my neighborhood, and because they cost more to buy.	5	10	50	35
I usually don't eat right because family or friends tempt me and are not supportive	6	6	48	40
I usually don't eat right because I am busy with family, work, or other responsibilities	8	10	32	50
I usually don't use food labels as a dietary guide because I don't know how to read the food label, and I have trouble with carbohydrate counting.	3	2	45	50
I usually participate in at least 30 minutes of moderate physical activity such as walking, jogging, housework and yard work at least 3 times a week	30	25	20	25
I am not usually physically active at least 30 minutes on all or most days of the week because I am very busy with family, work, or other responsibilities	12	18	40	30
I feel comfortable with my blood glucose monitoring skills	35	25	30	10
I know how to take my diabetes medications properly, and I am aware of their actions, potentials adverse effects, correct dosing, and timing.	40	25	15	20
I usually adhere to the treatment plan and compliant to my medication regimen as prescribed.	35	30	18	17
I know how to deal with hyperglycemia and hypoglycemia, and how to modify my regimen when my activity level changes, and what to do if I cannot afford medications or supplies.	30	30	20	20
I usually set goals and keep records to follow my blood sugar	40	30	20	10
I usually keep extra diabetes supplies in major places such in my car, at work to avoid shortages.	45	25	15	15
I sometimes have a feeling of self-blame when others believe that I am diabetic because of my unhealthy	5	7	38	50

lifestyles choices such as overeating and lack of exercise				
I am usually engaged in support group, and have knowledge of available resources	35	40	15	10
I feel overwhelmed by the diabetes-related expenses including regular visits to primary care providers and diabetes medications, because I am retired and live on fixed incomes.	15	25	35	25
I sometimes feel frustrated when I cannot express my needs or concerns related to diabetes to my healthcare provider because of my limited English proficiency.	10	10	40	40
I am sometimes very depressed and this impairs my ability to implement diabetes self-care behaviors including healthy eating, physical activity, blood glucose monitoring and medication administration.	18	12	40	30
I don't smoke, I usually see my primary care provider regularly, I get my yearly flu vaccine, I see my eye doctor and my dentist a least once a year, and I usually listen to my body.	34	48	10	8
I don't have enough knowledge about acute complications of diabetes, and how to avoid them.	9	10	42	39

APPENDIX I

Results – Post-test

Diabetes Self-Management Behaviors	**Post-test**			
	"Strongly disagree" (%)	"Disagree" (%)	"Agree" (%)	"Strongly agree" (%)
I don't usually eat healthy food because they are not always available in my neighborhood, and because they cost more to buy.	40	30	20	10
I usually don't eat right because family or friends tempt me and are not supportive	25	20	30	25
I usually don't eat right because I am busy with family, work, or other responsibilities	32	48	10	10
I usually don't use food labels as a dietary guide because I don't know how to read the food label, and I have trouble with carbohydrate counting.	35	55	5	5
I usually participate in at least 30 minutes of moderate physical activity such as walking, jogging, housework and yard work at least 3 times a week	20	10	40	30
I am not usually physically active at least 30 minutes on all or most days of the week because I am very busy with family, work, or other responsibilities	45	30	15	10
I feel comfortable with my blood glucose monitoring skills	3	7	50	40
I know how to take my diabetes medications properly, and I am aware of their actions, potentials adverse effects, correct dosing, and timing.	10	5	35	50
I usually adhere to the treatment plan and compliant to my medication regimen as prescribed.	3	3	48	46
I know how to deal with hyperglycemia and hypoglycemia, and how to modify my regimen when my activity level changes, and what to do if I cannot afford medications or supplies.	5	5	50	40
I usually set goals and keep records to follow my blood sugar	10	10	35	45
I usually keep extra diabetes supplies in major places such in my car, at work to avoid shortages.	12	13	40	35
I sometimes have a feeling of self-blame when others believe that I am diabetic because of my unhealthy	20	20	30	30

lifestyles choices such as overeating and lack of exercise.				
I am usually engaged in support group, and have knowledge of available resources	1	2	57	40
I feel overwhelmed by the diabetes-related expenses including regular visits to primary care providers and diabetes medications, because I am retired and live on fixed incomes.	44	40	6	10
I sometimes feel frustrated when I cannot express my needs or concerns related to diabetes to my healthcare provider because of my limited English proficiency.	30	20	30	20
I am sometimes very depressed and this impairs my ability to implement diabetes self-care behaviors including healthy eating, physical activity, blood glucose monitoring and medication administration.	45	35	15	5
I don't smoke, I usually see my primary care provider regularly, I get my yearly flu vaccine, I see my eye doctor and my dentist a least once a year, and I usually listen to my body.	25	35	20	20
I don't have enough knowledge about acute complications of diabetes, and how to avoid them.	50	46	2	2
The diabetes self-management education helped me improve my ability to make a better choice of foods.	15	10	40	35
The diabetes self-management education helped me improve my ability to participate in physical activity.	10	10	40	40
The diabetes self-management education helped me improve my ability to monitor my blood glucose level.	5	5	45	45
The diabetes self-management education helped me improve my ability to adhere to medication regimen as recommended.	10	20	40	30
The diabetes self-management education helped me improve my problem-solving skills.	10	15	30	45
The diabetes self-management education helped me improve my coping mechanisms.	15	30	30	25
The diabetes self-management education helped me improve my understanding of the risks related to diabetes complications and how to prevent them.	3	2	55	40
Overall, I was satisfied with the diabetes self-management education provided by the interdisciplinary team.	1	1	48	50

APPENDIX J

Results Pre- and Post-test

Diabetes Self-Management Behaviors	**Pre-test** "Strongly agree and Agree" (%)	**Post-test** "Strongly agree and Agree" (%)	**Change** "Strongly agree and Agree" (%)
I don't usually eat healthy food because they are not always available in my neighborhood, and because they cost more to buy.	85	30	(55)
I usually don't eat right because family or friends tempt me and are not supportive	88	55	(33)
I usually don't eat right because I am busy with family, work, or other responsibilities	82	20	(62)
I usually don't use food labels as a dietary guide because I don't know how to read the food label, and I have trouble carbohydrate counting.	95	10	(85)
I usually participate in at least 30 minutes of moderate physical activity such as walking, jogging, housework and yard work at least 3 times a week	45	70	25
I am not usually physically active at least 30 minutes on all or most days of the week because I am very busy with family, work, or other responsibilities	70	25	45
I feel comfortable with my blood glucose monitoring skills	40	90	50
I know how to take my diabetes medications properly, and I am aware of their actions, potentials adverse effects, correct dosing, and timing.	35	85	50
I usually adhere to the treatment plan and compliant to my medication regimen as prescribed.	35	94	59
I know how to deal with hyperglycemia and hypoglycemia, and how to modify my regimen when my activity level changes, and what to do if I cannot afford medications or supplies.	40	94	54
I usually set goals and keep records to follow my blood sugar	30	80	50
I usually keep extra diabetes supplies in major places such in my car, at work to avoid shortages.	30	75	45
I sometimes have a feeling of self-blame when others believe that I am diabetic because of my unhealthy lifestyles choices such as overeating and lack of exercise	88	60	(28)

I am usually engaged in support group, and have knowledge of available resources	25	97	72
I feel overwhelmed by the diabetes-related expenses including regular visits to primary care providers and diabetes medications, because I am retired and live on fixed incomes.	60	16	(44)
I sometimes feel frustrated when I cannot express my needs or concerns related to diabetes to my healthcare provider because of my limited English proficiency.	80	50	(30)
I am sometimes very depressed and this impairs my ability to implement diabetes self-care behaviors including healthy eating, physical activity, blood glucose monitoring and medication administration.	70	20	(50)
I don't smoke, I usually see my primary care provider regularly, I get my yearly flu vaccine, I see my eye doctor and my dentist a least once a year, and I usually listen to my body.	18	40	22
I don't have enough knowledge about acute complications of diabetes, and how to avoid them.	81	4	(77)
The diabetes self-management education helped me improve my ability to make a better choice of foods.		75	
The diabetes self-management education helped me improve my ability to participate in physical activity.		80	
The diabetes self-management education helped me improve my ability to monitor my blood glucose level.		90	
The diabetes self-management education helped me improve my ability to adhere to medication regimen as recommended.		70	
The diabetes self-management education helped me improve my problem-solving skills.		75	
The diabetes self-management education helped me improve my coping mechanisms.		55	
The diabetes self-management education helped me improve my understanding of the risks related to diabetes complications and how to prevent them.		95	
Overall, I was satisfied with the diabetes self-management education provided by the interdisciplinary team.		98	